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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Robert John Kodrzycki, Michael Ryan Becwar, Marie Bernice Connell-Porceddu, and Sarah Grace Schwuchow

Serial No.: Group Art Unit:

Filed:

For: Particle-Mediated Conifer Transformation

Examiner:

Honorable Commissioner of
Patents and Trademarks
Washington, DC 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

In accordance with 37 C.F.R. § 1.56, applicant wishes to call the attention of the Examiner to the following references:

<u>U.S. PATENT NO.</u>	<u>PATENTEE</u>	<u>ISSUE DATE</u>
4,672,035	Davidonis et al.	06/09/87
4,693,976	Schilperoort et al.	09/15/87
4,886,937	Sederoff et al.	12/12/89
4,945,050	Sanford et al.	07/31/90
5,122,466	Stomp, et al.	06/16/92
5,413,930	Becwar et al.	05/09/95
5,491,090	Handley, III et al.	02/13/96
5,506,136	Becwar et al.	04/09/96
5,565,355	Smith	10/15/96
5,677,185	Handley, III	10/14/97
5,681,730	Ellis	10/28/97
5,731,191	Rutter et al.	03/24/98
5,731,203	Handley, III	03/24/98
5,731,204	Rutter et al.	03/24/98
5,773,689	Thompson et al.	06/30/98

OTHER DOCUMENTS

International Publication Number WO 97/01641 (Walter et al.), Stable transformation of Undifferentiated Conifer Cells. International Publication Date: January 16, 1997.

South African Patent Number 99/3748, (Connett-Porceddu et al.), Particle-Mediated Conifer Transformation. Issue date February 23, 2000.

New Zealand Patent Number 336149, (Connett-Porceddu et al.), Particle-Mediated Conifer Transformation. Issue date February 8, 2001.

Becwar, M. R., and G. S. Pullman. 1995. Somatic embryogenesis in loblolly pine (*Pinus taeda* L.). In: Somatic embryogenesis in woody plants, Vol. 3. Edited by S. Jain, P. Gupta, and R. Newton. Kluwer Academic Publishers, The Netherlands. pp. 287-301.

Campbell, M. A., C. S. Kinlaw, and D. B. Neale. 1992. Expression of luciferase and β -glucuronidase in *Pinus radiata* suspension cells using electroporation and particle bombardment. Canadian Journal of Forest Research 22:2014-2018.

Charest, P. J., N. Caléro, D. Lachance, R. S. S. Datla, L. C. Duchêne, and E. W. T. Tsang. 1993. Microprojectile-DNA delivery in conifer species: factors affecting assessment of transient gene expression using the β -glucuronidase reporter gene. Plant Cell Reports 12:189-193.

Clapham, D., G. Manders, H. S. Yibrah and S. von Arnold. 1995. Enhancement of short- and medium-term expression of transgenes in embryogenic suspensions of *Picea abies* (L.) Karst. Journal of Experimental Botany 46:655-662.

Hakman, I. and L. C. Fowke. 1987. Somatic embryogenesis in *Picea glauca* (white spruce) and *Picea mariana* (black spruce). Canadian Journal of Botany 65:656-659.

Hakman, I. and S. von Arnold. 1988. Somatic embryogenesis and plant regeneration from suspension cultures of *Picea glauca* (White spruce). Physiologia Plantarum 72:579-587.

Loopstra, C. A., R. R. Sederoff. 1990. Gene Expression in Xylem of Loblolly Pine. Meeting of the International Union of Forestry Research Organizations Molecular Genetics Working Party S2.04.06. Institute of Forest Genetics.

Robertson, D., A. K. Weissinger, R. Ackley, S. Glover and R. R. Sederoff. 1992. Genetic transformation of Norway spruce (*Picea abies* (L.) Karst) using somatic embryo explants by microprojectile bombardment. Plant Molecular Biology 19:925-935.

Tsang E. W. T., P. J. Charest, and R. R. Sederoff. 1995. Genetic Transformation in Conifers. In: Recent Progress in Forest Biotechnology in Canada. (P. J. Charest and L. C. Duchesne, eds.) Petawawa National Forestry Institute. Information Report PI-X-120. pp 16-28.

von Arnold, S. and T. Eriksson. 1981. *In vitro* studies of adventitious shoot formation in *Pinus contorta*. Canadian Journal of Botany 59:870-874.

von Arnold, S. and I. Hakman. 1988. Regulation of somatic embryo development in *Picea abies* by abscisic acid (ABA). Journal of Plant Physiology 132:164-169.

Walter, C., D. R. Smith, M. B. Connell, L. Grace and D. W. R. White. 1994. A Biolistic approach for the transfer and expression of a *gusA* reporter gene in embryogenic cultures of *Pinus radiata*. Plant Cell Reports 14:69-74.

Webb, D. T., F. Webster, B. S. Flinn, D. R. Roberts, and D. D. Ellis. 1989. Factors influencing the induction of embryogenic and caulogenic callus from embryos of *Picea glauca* and *P. engelmannii*. Canadian Journal of Forest Research 19:1303-1308.

Copies of these references are submitted herewith along with form PTO-1449.

U.S. Patent No. 4,945,050 relates to particle-mediated DNA transfer procedures and the relevance thereof is discussed in the above-referenced patent application.

U.S. Patents Nos. 5,413,930, 5,491,090, 5,506,136, 5,677,185, 5,731,191, 5,731,203, and 5,731,204 relate to somatic embryogenesis processes in *Pinus*, and the relevance thereof is discussed in the above-referenced patent application.

U.S. Patent No. 5,681,730 relates a method for genetically transforming conifers and the relevance thereof is discussed in the above-referenced patent application.

U.S. Patent No. 5,122,466 relates to a method for the biolistic transformation of conifers. However, it was found that this method resulted in transient transformations. That is, no examples in the patent demonstrated stable transformations or the induction of shoots on the transformed plant tissue. This is confirmed by one of the co-inventors of the patent in the printed abstract of the 1990 presentation entitled "Gene Regulation in Xylem of Loblolly Pine" by Loopstra and Sederoff, wherein it was stated:

It is not yet possible to produce transgenic pines in which to test isolated elements for their ability to confer tissue specificity. We have been developing a transient assay for tissue specific expression using microprojectile bombardment of various pine tissues.

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U.S. Patent No. 5,565,355 teaches growth media for use with conifer embryogenic tissue and conifer embryos.

The remaining references are cited as being representative of the state of the art in this area.

These citations do not constitute an admission that the references are relevant or material to the claims; they are cited only as constituting the closest art of which the applicant is aware.

Respectfully Submitted,



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Attachments

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